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Department of Defense

Cost Reduction Report

December 1963



"Procurement of excessive quality . . . is just as wasteful as procurement of excessive quantities."

Robert S. McNamara

SYMPOSIA HIGHLIGHT VALUE ENGINEERING IMPORTANCE



Defense-Industry panelists exchange views at Chicago VE Symposium.

VE: MORE PROFITS, LESS COST

Industry profits go up and Defense costs come down when unneeded qualities are cut from weapons systems. This was the message received by 1200 government and business executives at Value Engineering Symposia during August and September in Washington, Dallas, New York, Chicago and Los Angeles.

These full-day symposiums, jointly sponsored by the Department of Defense and the National Security Industrial Association, were arranged by a special value assurance ad hoc committee of NSIA, established last May at the request of the Department of Defense and chaired by Mr. G. T. Willey, Vice-President and General Manager of Martin/Orlando.

The presentations and panel sessions at each Sym-
(Cont. on P. 7, PROFITS)

VE FUTURE BRIGHT, SAY DEFENSE OFFICIALS

"Value Engineering is probably the most promising element in the Department of Defense Cost Reduction Program," Defense officials reported at each of the five VE Symposia.

(Story in left column)

These officials point out that less than 20% of current hardware procurement is receiving VE attention and that only 47 of the top 100 prime contractors have organized VE programs.

Last July, Secretary McNamara informed the President that Value Engineering saved the DoD over \$1 million per week in FY 1963. Current goals in the Cost Reduction Program are \$104 million for FY 1964 and \$145 million for FY 1965. These goals are modest, say Defense officials, when contrasted with VE's "great potential."

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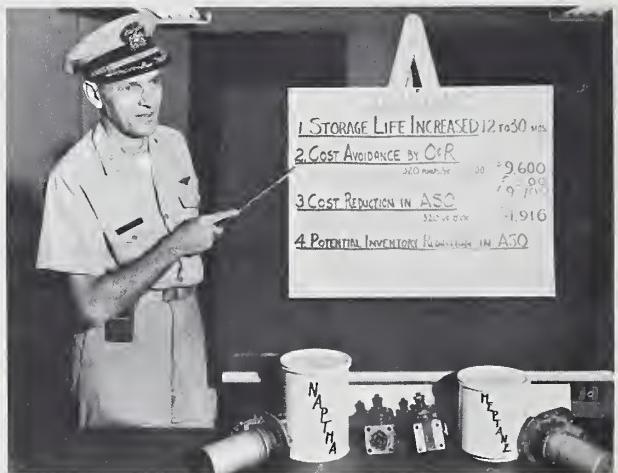
VE MESSAGE GETS ACROSS

- Half the VE battle is to make people VE-conscious. The DoD-NSIA Symposiums covered in our lead stories hit the top management level. But VE is everybody's business because full momentum will be reached only with the understanding and support of middle management and operating people, both in Defense and Industry.
- The Air Force had this objective in mind when, in the Spring of this year, it completed its New York to Los Angeles road show formally called "Value Engineering Indoctrination Seminars, Phase I". These briefings were aimed at Air Force's project, integration, design, production, quality and value engineers, and procurement, pricing, and contract management personnel. Similar seminars for Air Force contractors, particularly for design and production personnel, are now being planned.

HEPTANE FOR NAPHTHA BOOSTS FUEL PUMP LIFE

Seals in fuel pumps deteriorate slower when heptane is substituted for naphtha in bench tests, thus increasing storage life of the fuel pump 150%. As a result of this substitution, the number of pumps requiring re-work in any one year at NAS Jacksonville has been reduced from 800 to 320 for an annual manhour saving of \$9600 and a reduction in repair kit procurement of \$4916 a year. In addition, the potential reduction in pump inventory over a 2½ year period amounts to \$256,536.

- Another Service effort to get the VE word across was the two-week Bureau of Naval Weapons Seminar at NAS Jacksonville in 1962, which highlighted the responsibility of maintenance activities to meet quality requirements at the lowest possible processing cost and punched home the point that maintenance-type production activities have even more value analysis opportunities than manufacturing plants.
- VE is being accented at the Air Force Institute of Technology's School of Systems and Logistics at Wright-Patterson Air Force Base where the first two-week course on the subject opened in January of this year. At the end of October, 280 students (mainly specification engineers, price analysts, and control administrators) had been put through the seminars that make up the course.
- These VE training programs were one reason why Secretary McNamara could inform the President on July 8 that by eliminating gold-plating from procurement specifications, "we are now averaging savings well over \$1 million per week in reduced costs, and we expect these savings to triple during the next two years."



Capt. R. H. Fagan, Overhaul and Repair Officer at NAS Jacksonville, explains VE payoffs in switch from naphtha to heptane for fuel pump bench test.



AMERICAN LUMBER REPLACES FOREIGN

Substitution of Alaskan yellow cedar and synthetic materials for costly foreign woods such as lignum vitae, teak and mahogany slashed Navy lumber costs \$500,000 a year. The switch resulted from a study by C. C. Paul and D. F. Cook of the Naval Office at Port Hueneme, Calif.

Use of random widths in lieu of standard sizes, another recommendation of the study, led to elimination of 10 line supply items.

ERDL SLASHES FENCE POST COSTS

A million dollars was chopped from Army's last buy of military fence posts, and even greater savings are expected in future buys.

A revised specification, developed in the Army Mobility Command's Engineer Research and Development Laboratories at Fort Belvoir, removes the requirement for a particular steel in an annealed state and also permits alternatives in cross-section, provided strength, rigidity, length, width, and depth conform to the original requirement. These changes not only streamline the specification toward the less costly commercial product but also open the door to the most recent improvements.

FUEL GAGE P3A ORION AIRCRAFT

BEFORE

8 per Aircraft
Quick-reading gages
needed commercially
for fast turn-around

Unit cost: \$50.00



BETTER FLAGS AT HALF PRICE

Flag-making costs were cut over 50% by printing instead of sewing the design on the cloth background.

Value experts at DSA's Defense Clothing and Textile Supply Center sliced \$90,000 from the cost of 1500 Army field flags by substituting silk screen for applique in the specifications. Silk screen is a stencil method of printing in which a dye is pressed through a porous material to imprint the design on the cloth. The old applique method called for sketching the design on cloth and then hand-stitching each piece of the design to the flag blank.

NAVY CUTS FUEL MEASUREMENT COSTS

A single \$12 dip stick has replaced eight \$50 fuel gauges on wing tanks of the P3A Orion Aircraft for a \$19,000 saving in FY 1963 alone, representing a small additional contribution to Lockheed Aircraft Company's \$6.8 million in cost reductions since 1962 for BuWeps P3A Program.

The gauges were an integral part of the off-the-shelf Electra fuel quality ground check system to expedite the quick reading needed for fast turnaround in meeting tight commercial flight schedules. For military purposes, however, rapid reading was classed as a secondary function since there is normally sufficient time between missions for dip-stick measurement.

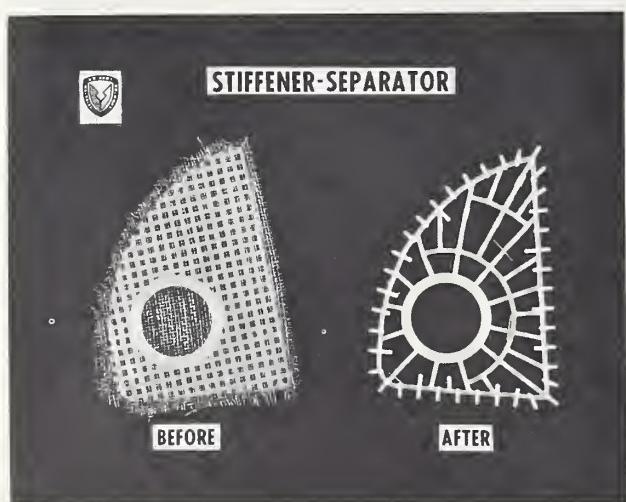
DSA PINCHES TWEEZER COSTS

Tweezers slated for one-time use in 256,000 medical first-aid kits for fallout shelters can do without the finer construction details that go into operating-room instruments. The Defense Medical Supply Center reached this conclusion when faced with production delays caused by the number of hand operations involved in making forceps of surgical stainless steel. Relief from exacting tolerances and substitution of less costly carbon steel, plated to resist corrosion, not only broke the production bottleneck but shaved unit costs from 50 cents to 15 cents for an \$85,000 saving.

TAXPAYERS SHARE VE SAVINGS

- Defense contractors can increase profits by cutting contract costs to the Government through Value Engineering. The Armed Service Procurement Regulation states: "It is the policy of the Department of Defense to incorporate provisions which encourage or require value engineering in all contracts of sufficient size and duration to offer reasonable likelihood for cost reduction."
- Contractors have been rolling up VE savings for some time. For example, the Carrier Air Conditioner Corporation redesigned the Brine Chiller Assembly of the Environmental Control System of USAF's Minuteman missile to come up with savings of \$206,000, shared 50-50 with the Government. In addition, the redesign reduced floor area, shrunk weight, simplified installation, and increased reliability.

- As another example, taxpayers received a \$107,000 dividend when Mine Safety Appliance Company of Pittsburgh redesigned the filter element in the Army's protective mask. Company engineers found that an injection-molded plastic stiffener could do the job as well as the more expensive two-part plastic stiffener and metal gauge separator.
- The "Stifferator", as the new piece is called, will go into 3,270,000 pairs of protective mask filters for a total savings of \$214,000.
- Although the DoD's VE history is replete with examples like these, Brig. Gen. M. C. Smith of USAF's Office of Systems and Logistics is quick to comment that there's plenty of room for more savings. General Smith says: "At last count, we had over 400 contracts containing Value Engineering clauses and the number is increasing daily. What bothers me though is the fact that very few Value Engineering cost reduction proposals have been processed to the point of a contract change."
- There is further evidence of Defense's speed in gobbling up Industry's cost-cutting proposals in the statement of Brig. Gen. Goshorn, USA, that in his area less than $\frac{1}{2}$ of 1% of VE change proposals have been rejected.
- R. Adm. E. Fawkes of Navy's Bureau of Weapons notes that a modest 3-to-4 man effort in General Dynamics Electric Boat Division generated a \$2.3 million cost reduction which was shared 50-50 with the Government over a 6-year period. The Admiral also points to Martin-Marietta's 3-year production of BULLPUP missiles under incentive arrangements where Navy's share of \$2,000,000 in value engineering cost reductions totaled \$1,500,000.



ASO TOP MONEY-SAVER

The 2½-year old value engineering program at the Aviation Supply Office, Philadelphia, Pa., is studied with cases of cost savings.

Joseph Flanigan, of the ASO Technical Division, figured out that current stocks of air nozzles could be economically changed and reworked into a new configuration that would meet all requirements desired. As a result of this idea, ASO realized a savings of \$228,452 in lieu of new procurement. Another ASO Employee, *David Small*, helped develop a universal engine shock mount that is saving the Government approximately \$43,000. *F. X. Fritton* proposed a change in the procurement and stocking procedure of "Quick Disconnect Fittings" and thereby saved approximately \$47,000. *B. Gittleman* suggested that aircraft anti-collision lights be standardized to save the Navy about \$7,600.

ASO's "value engineers" are to be found everywhere, in packing and shipping, in procurement and other fields along with the engineering department itself. For instance, the Navy netted



Joseph Flanigan receives \$400 Superior Accomplishment Award from ASO Commander Rear Admiral A. F. Kuehl, as Saul Schwartz, ASO VE Program Coordinator, looks on.

\$9,136 when packaging requirements for fuel injection system kits were revised. By eliminating chrome on bearings for wheel assemblies, \$2,150 was saved. ASO officials estimate that in a little over two years of actual operation of its value engineering drive, the program has produced cost reductions totaling approximately \$1,240,000. At ASO, obviously, there's no goldbricking in getting rid of gold-plating.

AF ZEROES IN ON SOR

A simpler, more reliable, and less costly radar to provide navigational support, terrain avoidance, and target location for the RF-4C Aircraft has emerged from studies showing that the system specified by The System Operational Requirement (SOR) far exceeded operational needs.

This modified AN/APN-149 RADAR is being developed by Texas Instrument Company, selected by the RF-4C prime contractor (McDonnell Aircraft Company) in a subcontract competition. Expected acquisition savings are \$1.1 million in FY 1963, \$3.5 million in FY 1964, and \$5.0 million in FY 1965. Estimates of follow-on savings in spares, maintenance and operations run to \$4.0 million.

Fringe benefits are a 37 percent weight reduction in an area already weight critical and a 100 percent increase in mean-time between failures.

PADS FIXED FASTER AT LESS COST

Value engineers of San Bernardino Air Materiel Area at Norton Air Force Base have found a way to speed repair of ATLAS missile launch pads after firings and, at the same time, cut costs \$8,000 per launch for a total savings of \$50,000 per year.

Longest lead time item, and therefore the pacing item in readying the pad, is the sight tube assembly, a long plastic cylinder with supporting and counterbalancing mechanisms used in final setting of the guidance system. Value engineers found that major damage was scorching and warping of the plastic tube and that the \$10,000 assembly could be repaired in a short time at minimum cost instead of scrapping and replacing as had been the practice.

COOL \$500,000 EXPECTED FROM AIR-CONDITIONING SUBSTITUTE

Lower operating temperatures than originally expected in The Communication-Navigation-Identification electronic package for the CRUSADEER aircraft permits a small fan to cool a "hot" spot in the transmitter, thus eliminating expensive lead-ins from the plane's central air conditioner.

Chance Vought's Aeronautics & Missiles Division estimates over a half million dollars in savings will be realized by substituting the small fan and a relatively inexpensive pressure regulator for the original pressure and exit plumbing requirement, a check valve, a temperature probe and controller, and by-pass control valve and a pressure control valve.

WATERVLIET ENGINEERS SAVE 58% ON RIFLE LEG BRACKET

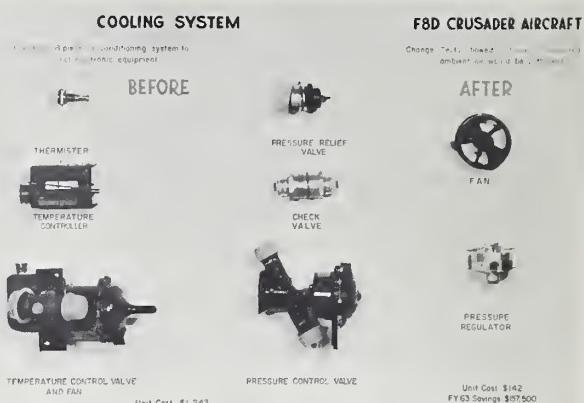
Engineers at Army's Watervliet Arsenal, New York, took a second look at the rear bracket assembly for the 90mm recoilless rifle and reduced its cost by 58%.

The function of the assembly is to hold the bipod leg to the rifle tube. The part had been manufactured from a forging weighing 4 lbs. 4 oz. and requiring 33 separate manufacturing operations. As formerly produced, this assembly had a unit cost of \$61.00.

Value engineering modified this design to a 3-piece assembly consisting of two castings and a simple stamping, and requiring only 3 operations. The redesigned assembly had a unit cost of \$25.25. The 58% reduction in unit cost yielded a total saving in excess of \$45,000 on a current production order for these weapons.

MINEFIELD CLEARING COSTS SCALED

A snake-like device to clear a path large enough for tanks, vehicles, and personnel to move through minefields has been re-engineered by Army Material Command to cut \$700,000 from manufacturing costs this year and to produce several millions more in savings in future years.



Incorporation of the change in all 500 F8D and F8E aircraft will reduce the costs per airplane for this cooling feature from \$1,243 to \$142.

The device, called the M-157 Demolition Kit, is designed so that it can be pushed for emplacement by a medium tank with special accessories.



GOLDPLATING VS. GOLDPLATING

Goldplating—an unsavory word meaning excessive quality—is used in another sense at Boeing's Aerospace Division where damaged Minuteman matrix boards, used in aging and testing high reliability electronic parts, are salvaged by re-plating worn contact stripes with gold and repairing broken circuitry. Part of the repaired board can then be used in small test runs of electronic parts.

Reclamation cost per board is \$3.11 whereas price of a new board is \$25. The \$112,500 saved by this procedure in FY 1964 is expected to be duplicated in FY 1965.

BULKHEADS GET VE TREATMENT

Stronger bulkheads with fewer supports and an annual cost saving of \$72,930 at one shipyard alone were the results of a BuShips VE study that substituted vertical interlocking seams on the vertical stiffness for the more costly sheet-shearing, hole-layout, punching, drilling and riveting operations.

The new bulkheads not only look better, weigh less, and conserve material but are easier to paint, can be installed at considerably less cost, and can be removed without damage.

ARSENAL SHOOTS DOWN COSTS

Picatinny Arsenal's Ed Jescerzewski convinced management that substituting aluminum for brass

VE PROFITS (from page 1)

posium covered Industry's views of VE, recent developments in DoD's VE Program, and Army, Navy, Air Force, and DSA views on VE.

Major talks were made by Milo P. McCammon, General Manager, Eclipse Pioneer Division, Bendix Corporation, who presented "An Industry View of Value Engineering", and George E. Fouch, Deputy Assistant Secretary of Defense for Equipment Maintenance and Readiness, who discussed "Developments in the DoD Value Engineering Program."

in blank cartridge cases not only reduced costs by 85%, but also increased reliability, reduced weight by nearly 60%, conserved critical material, and eliminated salvage requirements.

Jescerzewski's idea, put into practice by Frankford Arsenal and Mueller Brass Company, will save \$2 million through 1965 and \$4 million through 1967. Offsetting engineering costs, by comparison, were a minuscule \$10,000.

FEWER REPAIRS FOR MISSILE LAUNCH HARDWARE

Expensive components of Atlas launch pads incur far less damage from missile exhaust flames when covered by dynatherm, an easy-to-apply protective coating that has replaced less effective and less durable insulation such as asbestos.

This substitution, suggested by an employee of General Dynamics' Astronautics Division, is expected to prevent \$6 million in launch-pad repairs during FY 1964.

Panelists were: Brig. Gen. J. A. Goshorn, USA; R. Adm. E. E. Fawkes, USN; Brig. Gen. M. C. Smith, USAF; R. Adm. C. A. Blick, USN(DSA); Col. W. W. Thybony, Mr. K. Kilgore, and Mr. S. Collins, all from the office of The Secretary of Defense. Deputy Assistant Secretary Fouch served as moderator.



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AIR FORCE WOOS ECONOMY

Elsewhere VAMP may mean flirt, but in Air Force's air material areas it means renovate, remake, re-do, and find a better way under The Value Analysis—Materiel Procurement Program (VAMP).

This Air Force definition receives real meaning from dollar-and-cents findings and results like those made recently by engineering and supply people at Mobile Air Materiel Area on regulators for air compressors.

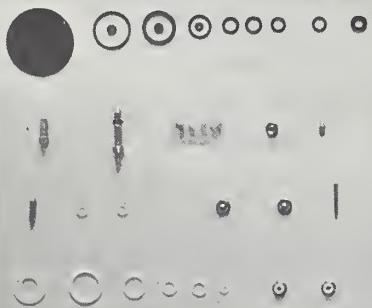
Finding: One kind of regulator valve will do the job for which two kinds were being bought.

Result: Cancellation of a pending \$19,000 purchase order for 98 of one kind and filling of current requirements from plentiful on-hand stocks of the other kind.

Finding: Regulator repairs cost less than new regulators. Result: Elimination of the excessive rate at which regulators were being issued.

Finding: Regulator repair kits contained more items than were needed. Result: Elimination of low-demand items, reducing cost from \$109 to \$44 per kit and producing net annual savings of \$23,000.

**COMPRISE THE KIT AFTER VALUE ANALYSIS
NEW KIT PRICE \$44⁰⁰**



**DELETED FROM THE KIT
ORIGINAL KIT PRICE \$109⁰⁰**



VALUE ENGINEERING COST REDUCTION GOALS

This issue of the Cost Reduction Report has been devoted exclusively to Value Engineering, which represents only one of twenty-five cost-reduction sub-programs formally organized to date under the Cost Reduction Program. The current goal of the Value Engineering Program is to achieve annual savings of at least \$145 million per year by FY 1965 and each year thereafter.

Goals by Department/Agency are as follows (millions):

	<i>Goal 1963</i>	<i>Accomplished 1963</i>	<i>Goal 1964</i>	<i>Goal 1965</i>
Army-----	11	20	20	30
Navy-----	26	24	40	60
Air Force-----	25	26	41	50
DSA-----	2	2	3	5
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	\$64	\$72	\$104	\$145